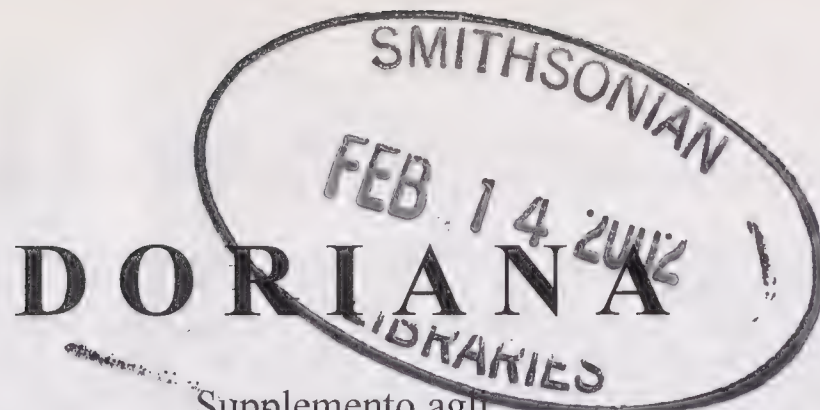


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DESCRIPTION OF *AMOLOPS (HUIA) MODIGLIANII*,
NEW SPECIES FROM SUMATRA
(AMPHIBIA, ANURA, RANIDAE)

INTRODUCTION - Since 1996 we have been working on the revision of the Amphibians collection of the Museo Civico di Storia Naturale "G. Doria" of Genova, going on for geographical areas and checking the correct identification of any specimen following the most recent general taxonomy works (FROST, 1985; DUELLMAN, 1993).

In the rich material from south-eastern Asia we found also 943 specimens (belonging to 25 species) collected by Modigliani in Sumatra and Nias.

Elio Modigliani (1860-1932) explored Nias, Sumatra, Engano and Mentawai Islands attending particularly to anthropology and ethnography (VINCIGUERRA, 1933), collecting however animals of many different groups that were sent to the Museum of Genova; in 1933 (according to GESTRO, 1933) the Modigliani's zoological materials were illustrated in more than 100 papers, with the description of 984 new genera and species; but many new taxa were recently added to this list.

During the exploration in Sumatra, Modigliani stayed, from October 1890 to March 1891, near Lake Toba in the Forest of Si Rambé at 1370 metres of altitude (MODIGLIANI, 1892), where he collected also the two amphibian specimens object of this work.

These specimens were held in a jar, with a label "*Rana macrocnemis* n. sp." handwritten by Decio Vinciguerra, who studied the ichthyological and herpetological collections of Genova Museum (GESTRO, 1935); Vinciguerra realized that it was a new species but he did not published the description and assigned it the name *macrocnemis* overlooking that the same name was already used by Boulenger in 1885 for a frog of the *Rana temporaria* group. The specimens were registered with the number 29363 of the accessions catalogue by

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R. Gestro, probably in February 1930; from that time the specimens remained in collection under the name "*Rana macrocnemis* Vinciguerra" and were not reported in the catalogue of types of the Museum (CAPOCACCIA, 1957).

From literature (MANTHEY & GROSSMANN, 1997; YANG, 1991) the specimens seemed to be a species not yet described of the genus *Amolops* Cope, 1865; this genus, divided in the subgenera *Amo* Dubois, 1992, *Amolops* s. str., *Huya* Yang, 1991 and *Meristogenys* Yang, 1991 by DUBOIS (1992), is represented by 35 species; its distribution, according to DUELLMAN (1993), covers "southeastern Asia from Nepal and northeastern India to western and southern China, Thailand and Greater Sunda Is."

MATERIALS AND METHODS - To have the confirmation of the validity of the species we examined also the type material of *Amolops (Huia) sumatranus* (Yang, 1991), the only species of the genus till now known for Sumatra: holotype, FMNH 209922, adult male, collected in Indonesia, Sumatra, Bohorok, Bukit Lawang Forest Reserve (3°31'N 98°8'E) by H.K. Voris, 22.VII.1976; paratype, ZMA 5090, adult female, collected in Indonesia, Sumatra, Deli, Gambir by L.P. Debussey, VIII.1905.

We also examined two specimens, from Sumatra, that YANG (1991) in the discussion on *Huia sumatrana* considered that "probably represent a separate species": ZMA 5094, adult male, collected in Indonesia, Sumatra, Pajinggahan by M. Weber (without date); ZMA 5091, immature male, collected in Indonesia, Sumatra, Bantjan Batu (Karolanden) (400 metres of altitude) by F.C. van Heurn, 8.VI.1919. (Figure 1).

Measurements were made following YANG (1991); snout-vent length is abbreviated as SVL. MSNG = Museo Civico di Storia Naturale "G. Doria", Genova; FMNH = Field Museum of Natural History, Chicago; ZMA = Zoölogisch Museum, Amsterdam.

***Amolops (Huia) modiglianii* n. sp.**

Holotype - MSNG 29363, adult male, collected in Indonesia, Sumatra, Si Rambé (2°19'N 99°13'E) by Elio Modigliani in the first months of 1891 (figures 2 and 3).

Paratypes - MSNG 49745, adult female, same data as holotype (figures 4, 5 and 6); ZMA 5091, immature male, collected in Indonesia, Sumatra, Bantjan Batu (Karolanden) (400 metres of altitude) by F.C. van Heurn, 8.VI.1919.

Diagnosis - *A. modiglianii* is characterised by large disk of third finger, tympanum with evident raised rim, several crossbars on hind limb, disks of toes smaller than those of fingers, first finger slightly shorter than second and absence of outer metatarsal tubercle (table 1).

Description - A small species, male 31.76 mm, female 55.09 mm; length of head greater than width; snout slightly pointed; nostril nearer to tip of snout than to eye; canthi distinct; tympanum large, round and translucent, with evident raised rim, about $1/2 - 3/4$ diameter of eye; vomerine teeth forming an oblique row. Fingers slender, first finger slightly shorter than second; tips of all fingers expanded into round disks, larger in female than in male, with circummarginal

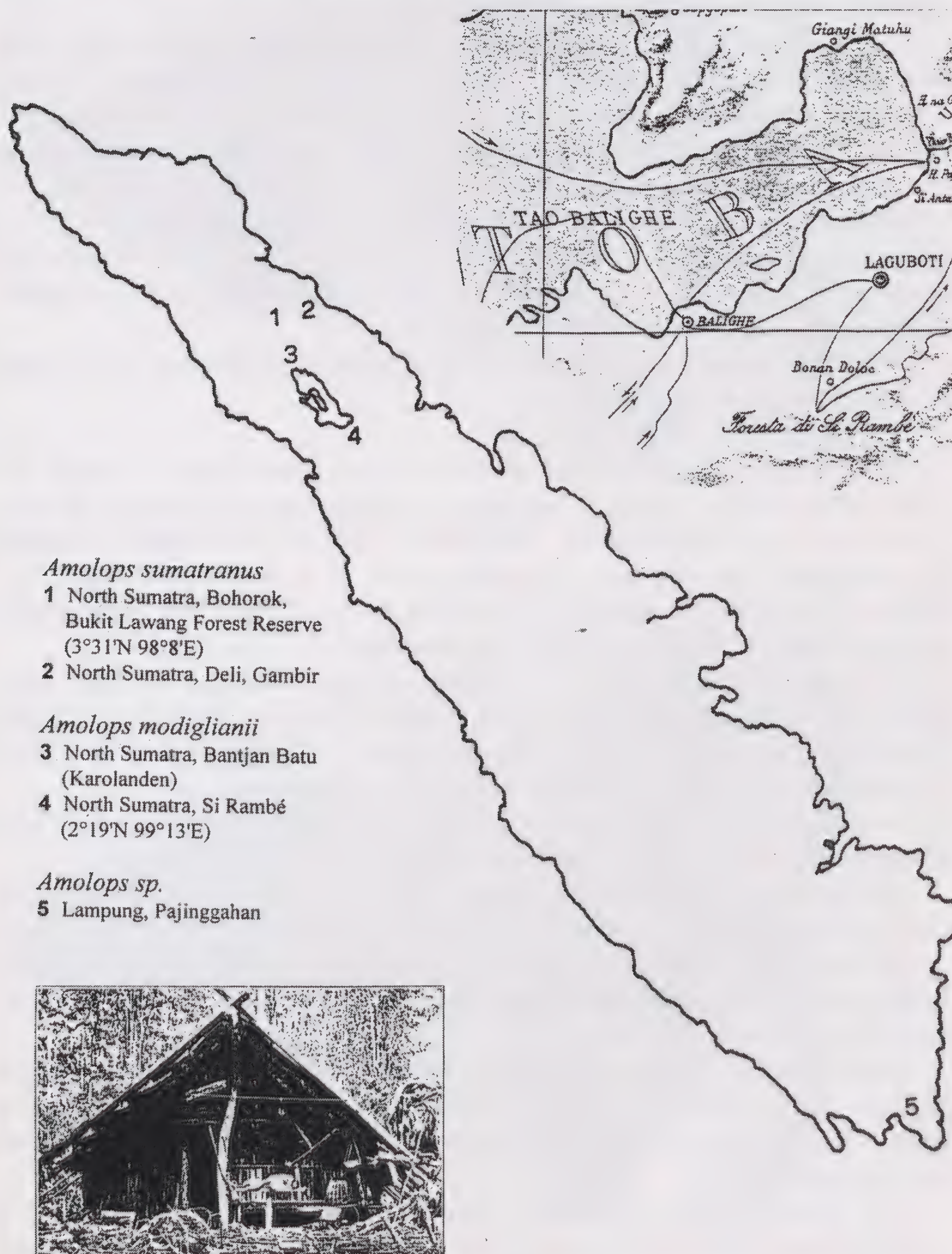


Fig. 1 - Centre: sketch of Sumatra with the localities recorded. Up-right: particular of the map of MODIGLIANI (1892) in which is reported "Foresta di Si Rambé". Down-left: the "house" of Modigliani in the forest of Si Rambé; the photo is published in MODIGLIANI (1892).

grooves; disk of third finger 0.31-0.40 times diameter of tympanum in males, 0.83 in female; subarticular tubercles present; hind limb long, length of tibia about $2/3$ SVL; disks of toes smaller than those of fingers, slightly in males and highly in female; fourth toe webbed only as far as the distant subarticular tubercle; subarticular tubercles oval and bulging; a small oval inner metatarsal tubercle; outer metatarsal tubercle absent. Skin slightly rough on back, smooth on belly; dorsolateral and temporal folds present.

Colour in life unknown. In alcohol, brown on back and limbs; male with dark band along dorsolateral fold; four dark crossbars on forearm in male; six crossbars on thigh and six on tibia; rear of thigh brown with small light-coloured spots; dark spots on lower jaw; thorax and throat largely spotted; round dark spots on flanks.

Male with gular pouches; velvety nuptial pad on first finger.

Length of head 0.39-0.44 times SVL; width of head 0.33-0.35 times SVL; diameter of tympanum 0.46 of eye diameter in female, 0.70-0.72 in males; length of tibia 0.70-0.80 times SVL (table 2).

Derivatio nominis - The name of the species is given after its collector E. Modigliani.

DISCUSSION - *A. modiglianii* differs from *A. sumatranus* as regards the 7 characters listed in table 1. As regards measurements and ratios of table 2, they are very similar except "diameter of disk of third finger / diameter of tympanum"; for this ratio, regarding male of *A. sumatranus*, there is a difference between our value (0.29) and that of Yang (0.61); this fact probably depends from the 11 juveniles paratypes measured by YANG (1991).

We assign *A. modiglianii* to the subgenus *Huia* for: length of tibia > 0.7 times SVL, disks smaller in width than diameter of tympanum, tympanum near eye in male; distribution: Java, Sumatra, Borneo, Thailand, China. The other three subgenera in fact have different characters listed above:

Amo: outer metatarsal tubercle present, axillary glands in adults of both sexes present; distribution: Thailand and Malaya;

Amolops: length of tibia < 0.7 times SVL, disk of third finger larger than tympanum; distribution: southeastern Asia (mainland);

Meristogenys: disks of at least three inner toes slightly larger or equal to those of fingers; outer metatarsal tubercle present, skin with small horny granules; distribution: Borneo.

Examining the specimen ZMA 5091, immature male, we have ratios similar to those of the two species from Sumatra; otherwise the 7 characters of table 1 are identical to *A. modiglianii*, so we assign this specimen to this last species as paratype.

The specimen ZMA 5094, adult male, on the contrary is not identified as is badly faded, without colours; for three characters is similar to *A. modiglianii* (circum-tympanum raised rim, fourth toe webbed at distant subarticular tubercle, outer metatarsal tubercle absent) and for two to *A. sumatranus* (disks of toes



Fig. 2 - Holotype of *Amolops modiglianii* (MSNG 29363, male): dorsal view.



Fig. 3 - Holotype of *Amolops modiglianii* (MSNG 29363, male): ventral view.

equal to those of fingers, first finger slightly longer than second); length of head 0.42 times SVL, width of head 0.36 times SVL, diameter of tympanum 0.79 times diameter of eye, length of tibia 0.72 times SVL, diameter of disk of third finger 0.23 times diameter of tympanum; considering also the collection locality in southern Sumatra, new fresh material is necessary for a correct identification.

Tab. 1 - Principal characters to distinguish *Amolops modiglianii* n. sp. and *Amolops sumatranus* (Yang, 1991).

	<i>Amolops modiglianii</i> n. sp.	<i>Amolops sumatranus</i> (Yang, 1991)
circum-tympanum raised rim	present	absent
fourth toe webbed	at distant subarticular tubercle	fully
crossbars on thigh	6	4
crossbars on tibia	6	3
outer metatarsal tubercle	absent	present
disks of toes to those of fingers	smaller	equal
first finger to second finger	slightly shorter	slightly longer

Tab. 2 - Measurements of holotypes and paratypes of *A. modiglianii* n. sp. and *A. sumatranus* (Yang, 1991).

	<i>Amolops modiglianii</i> holotype	<i>Amolops modiglianii</i> paratype	<i>Amolops modiglianii</i> paratype	<i>Amolops sumatranus</i> holotype	<i>Amolops sumatranus</i> paratype
collection number	MSNG 29363	MSNG 49745	ZMA 5091	FMNH 209922	ZMA 5090
age and sex	adult male	adult female	immature male	adult male	adult female
SVL	31.76 mm	55.09 mm	24.55 mm	30.35 mm	66 mm
length of head	13.05 mm	21.55 mm	10.9 mm	12.71 mm	24.8 mm
width of head	10.42 mm	18.63 mm	8.55 mm	10.34 mm	21.02 mm
length of head (times SVL)	0.41	0.39	0.44	0.42	0.38
width of head (times SVL)	0.33	0.34	0.35	0.34	0.32
diameter of tympanum	3.11 mm	3.24 mm	2.45 mm	3.48 mm	4.18 mm
diameter of eye	4.34 mm	7.04 mm	3.5 mm	4.39 mm	7.55 mm
diameter of tympanum (times diameter of eye)	0.72	0.46	0.70	0.79	0.55
length of tibia	22.08 mm	38.81 mm	19.7 mm	22.78 mm	46.42 mm
length of tibia (times SVL)	0.70	0.70	0.80	0.75	0.70
diameter of disk of third finger	1.25 mm	2.7 mm	1.07 mm	1 mm	1.38 mm
diameter of disk of third finger (times diameter of tympanum)	0.40	0.83	0.31	0.29	0.33



Fig. 4 - Paratype of *Amolops modiglianii* (MSNG 49745, female): dorsal view.

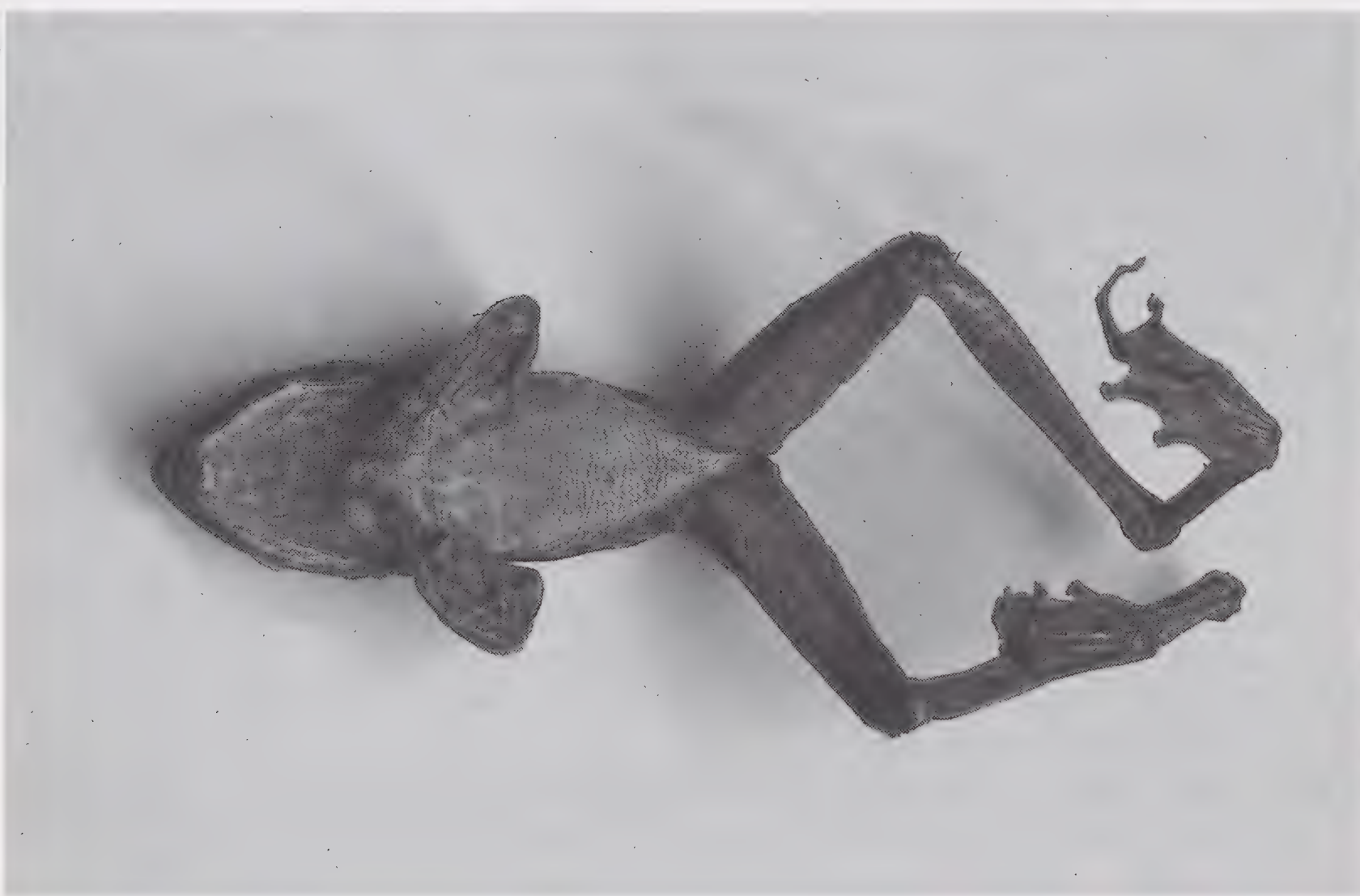


Fig. 5 - Paratype of *Amolops modiglianii* (MSNG 49745, female): ventral view.

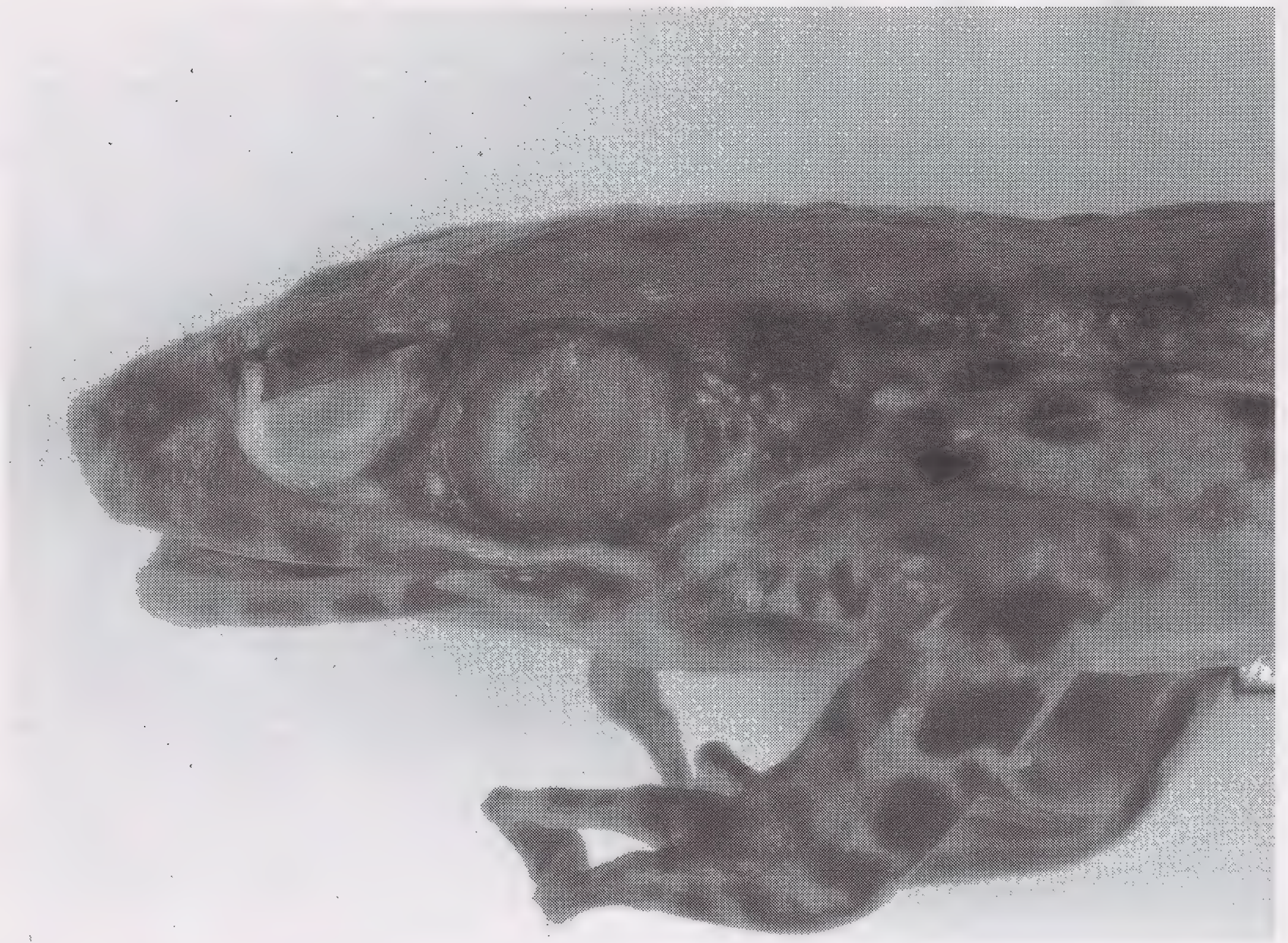


Fig. 6 - Paratype of *Amolops modiglianii* (MSNG 49745, female): particular of head.

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SUMMARY

The new species is the second described from Sumatra and at present is known from the region of Toba Lake. Measurements and characters are given, also in comparison to those of *A. sumatranus*.

RIASSUNTO

Descrizione di *Amolops (Huia) modiglianii*, nuova specie di Sumatra (Amphibia, Anura, Ranidae). La nuova specie, la seconda del genere presente a Sumatra e al momento localizzata nei dintorni del Lago Toba, è affine a *Amolops sumatranus* (Yang); ne differisce per la presenza di bordo intorno al timpano, di 6 bande trasversali sulla coscia, di 6 sulla tibia, per l'assenza di tubercolo metatarsale esterno, per i dischi delle dita dei piedi più piccoli di quelli delle mani e per il primo dito della mano leggermente più corto del secondo.